IN THE CLAIMS:

1. (Currently amended) A fuzzy inference system for use in modulating radiation treatment, said system comprising:

single input fuzzifier means for inputting <u>and optimizing</u> singular imaging data <u>and a physician's treatment intention including dose/volume constraints for critical organs, normal tissues, targets and compromising strategy between critical organs, normal tissues, and targets</u>;

inference means operatively connected to said fuzzifier means, said inference means for analyzing the imaging data <u>and the physician's treatment intention</u> and determining radiation treatment target from non-treatment target; and

defuzzifier means for modulating radiation treatment pursuant to the analysis from said inference means.

2. (Previously presented) The system according to claim 1, wherein said system is computer based.

3. (Previously presented) A method of modulating radiation treatment by: inputting patient data into the fuzzy inference system according to claim 1; and modulating radiation treatment pursuant to data obtained from the fuzzy inference system.

4. (Previously presented) The method according to claim 3, wherein said modulating step includes automatically modulating radiation treatment.

5. (Previously presented) The method according to claim 4, wherein said modulating step includes automatically modulating radiation treatment via a computer.

6. (Previously presented) The method according to claim 3, wherein said modulating step includes increasing the amount of radiation at a specified location.

7. (Previously presented) The method according to claim 3, wherein said modulating step includes decreasing the amount of radiation at a specified location.

8. (Previously presented) An apparatus for producing modulating radiation therapy in patients, said apparatus comprising:

an imaging device for creating and storing image data of relevant tissue and organ parts; and

a fuzzy inference system according to claim 1, said system operatively connected to said imaging device for modulating radiation treatment.

9. (Previously presented) The apparatus according to claim 8, wherein said system is computer based.

10. (Currently amended) A fuzzy inference system for use in modulating radiation treatment, said system comprising:

single input fuzzifier means for inputting <u>and optimizing</u> singular imaging data <u>and a physician's treatment intention including dose/volume constraints for critical organs, normal tissues, targets and compromising strategy between critical organs, normal tissues, and targets</u>;

inference means operatively connected to said fuzzifier means, said inference means for analyzing the imaging data <u>and the physician's treatment intention</u> and determining strength of radiation treatment; and

defuzzifier means for modulating radiation treatment pursuant to the analysis from said inference means.

11. (Previously presented) The system according to claim 10, wherein said system is computer based.